Space Weather Forecast

Issued on Sunday, 04 December 2022 at 13:08 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Daily Chance of Moderate flares. Chance of G1/Minor Storms Day 4 (7 Dec).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate with one brief Moderate flare at 03/1741 UTC, likely emanating from a sunspot region emerging over the northeast limb. There are currently eight regions on the visible disc, the majority of these in the northeast and generally small and simple. One large sunspot region in the southeast remains stable and mature. The main developmental region was a sunspot in the northwest. No Earth-directed CMEs (coronal mass ejections) were observed in the last 24 hours. However, CME imagery of a small filament eruption in the northeast is yet to be analysed.

Solar Wind / Geomagnetic Activity: The solar wind was indicative of declining fast solar winds from a coronal hole. Elevated solar winds gradually eased from 600km/s to around 500 km/s. The total magnetic field was weak, with no significant north-south component observed. Resultant geomagnetic activity was Quiet to Unsettled (Kp 1-3).
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at Background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is expected to prevail, with further Common-class flares, and a daily chance of isolated Moderate flares.

Solar Wind / Geomagnetic Activity: Low confidence in the arrival on Day 1 (4 Dec) of a slow CME on the 29 Nov. Solar winds are expected to decrease towards Background as the effects of a stream of fast winds from a coronal hole wane. The next period of coronal hole sourced fast winds is expected to arrive on Day 4 (7 Dec) with peak winds of 500-600 km/s likely. Mainly Quiet to Unsettled geomagnetic activity expected through Days 1-3 (4-6 Dec), although the potential CME arrival on Day 1 brings a chance of Active intervals and a slight chance of G1/Minor Storms. Activity increasing to Unsettled to Active with a chance of G1/Minor storm intervals Day 4 (7 Dec).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at Background levels with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	1	10	40
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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